Interactive comment on "Technical note: Pitfalls in using log-transformed flows within the KGE criterion" *by* Léonard Santos et al.

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Santos et al. present a highly relevant technical note about the application of log-transformations in combination with the Kling-Gupta Criterion. The manuscript is well written, well-structured, and contains a relevant example to demonstrate their point. Please find below my (mainly minor) comments.

"Major"

P. 6 l. 3-4 "Furthermore, this result can be completed by making the same plot

for other transformations giving more weight on low flows. Figure 4 shows that square rooted (Fig. 4 (a) and (b)) and inverse (Fig. 4 (c) and (d)) transformations do encounter the same problems as with the logarithm for catchments that have an average log-transformed flow around zero." This statement is inconsistent with the figures. The square root transformation does show a completely different pattern. Please clarify.

Related to that; table 1 states that square root transformation does not increase low flow weight, but to me it seems that it diminishes the weight of high flows, thereby somehow increasing the weight of low flows. Please clarify.

p. 8 l. 3 I understand "optimistic" refers to a higher model performance for KGE' when evaluated in l/s compared to m3/s. However, I don't really understand how Eq. 5 automatically implies this. In Eq. 5 I see that log(1000) is always added, but whether this leads to an improved or decreased model performance seems to me dependent on the bias in the model. Please clarify.

Minor

p. 4 l. 13 It would be good if the order of Box-Cox and adding a constant is changed in order to be consistent with results.

Figure 2 is relevant and insightful, but it takes some time to understand all information. Perhaps, it can be stressed in the caption that left, simulated in shown in red and right observed is shown in red (as is also done for a figure later in the manuscript).

p. 6 l. 7 "remain correct". Correct seems a vague term in this context (what is a correct objective function value?). Please consider rewording.

Consider to include the original KGE equation in Section 2 as well, especially because this information is relevant in the discussion of the modified Box-Cox. E.g. p. 9 l. 20, it will not affect the KGE because μ_s is not in the denominator in the original KGE (perhaps help the reader on this as well, e.g. on p. 10 just above the section Summary).

p. 3 l. 19 conversation -> conversion

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